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10/540,561

06/24/2005

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EXAMINER

SALZMAN, KOURTNEY R

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

|                              |  |                                     |  |
|------------------------------|--|-------------------------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/540,561   | <b>Applicant(s)</b><br>KONDO ET AL. |  |
|                              | <b>Examiner</b><br>KOURTNEY R. SALZMAN | <b>Art Unit</b><br>1795             |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 24 June 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>June 24, 2005 and August 1, 2006</u> .                        | 6) <input type="checkbox"/> Other: _____                          |



## **DETAILED ACTION**

### ***Summary***

1. This is the first office action on the merits for application number 10/540,561 filed June 24, 2005. This is the 371 application for PCT/JP03/16840 filed December 25, 2003.
2. The preliminary amendment filed June 24, 2005 has been entered and fully considered.

### ***Priority***

3. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –  
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by NADANAMI et al (EP 1103807A2).

Regarding claim 1, NADANAMI et al teaches, in paragraphs 19 and 20, a proton-conductive layer contacting two electrodes with catalyst. Paragraph 26 teaches the electrodes to be in contact with an atmosphere of the measurement gas. Paragraph 28 teaches the application of voltage to each electrode and the measurement being equated to the concentration. The

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Regarding claim 2, NADANAMI et al teaches, in paragraphs 19 and 20, a proton-conductive layer contacting two electrodes with catalyst. Claim 2 teaches only the first electrode to be contacting the gas atmosphere, causing the second to not be exposed. Paragraph 28 teaches the application of voltage to each electrode and the measurement being equated to the concentration. The first electrode 3 is shielded from the gas atmosphere by the diffusion layer 6.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

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not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 3-23 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over NADANAMI et al (EP 1103807 A2), in view of DIETZ et al (US 4,419,190).

NADANAMI et al teaches all the limitations of claim 2, but fails to teach the addition of a DC current.

Regarding claim 3, DIETZ et al teaches the apparatus of a gas sensor for the application of an AC and DC currents, as stated in column 2, lines 46-49. Any manipulation of the apparatus required such as a higher electric potential in the first electrode than the second is functional language stating an intended use and is therefore not considered in a claim to apparatus.

At the time of invention, it would have been obvious to one of ordinary skill in the art to apply a DC and AC voltage in the same sensor as shown in DIETZ et al to the sensor of NADANAMI et al because DIETZ et al teaches the addition of both currents to the sensor enables temperature sensitive readings to be made, as stated in the abstract.

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Claim 4 recites intended operating conditions or usage for the apparatus, not structure for manipulating the power voltage to the sensor, therefore no weight is given to this claim.

Regarding claim 5, NADANAMI et al teaches, in paragraphs 19 and 20, a proton-conductive layer contacting two electrodes with catalyst. Claim 2 teaches only the first electrode to be contacting the gas atmosphere, causing the second to not be exposed. Paragraph 28 teaches the application of voltage to each electrode and the measurement being equated to the concentration. As shown in figure 1, the gas enters the diffusion-rate determining portion, reference number 6, above the first electrode. The measurement chamber continues from reference number 6 to surround the electrode, as shown by the spacing to the sides of the electrode within the supports and also until meeting the proton conducting layer. Power is shown to be connected to both electrodes in figure 1.

DIETZ et al teaches the apparatus of a gas sensor for the application of an AC and DC currents, as stated in column 2, lines 46-49. The use of these current applications, such as for determining concentration or requiring a higher electrical potential in the first electrode than the second is functional language stating an intended use and is therefore not considered in a claim to apparatus.

At the time of invention, it would have been obvious to one of ordinary skill in the

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art to apply a DC and AC voltage in the same sensor as shown in DIETZ et al to the sensor of NADANAMI et al because DIETZ et al teaches the addition of both currents to the sensor enables temperature sensitive readings to be made, as stated in the abstract.

Regarding claim 6, NADANAMI et al teaches, in paragraphs 19 and 20, a proton-conductive layer contacting two electrodes with catalyst. Claim 2 teaches only the first electrode to be contacting the gas atmosphere, causing the second to not be exposed. Paragraph 28 teaches the application of voltage to each electrode and the measurement being equated to the concentration. As shown in figure 1, the gas enters the diffusion-rate determining portion, reference number 6, above the first electrode. The measurement chamber continues from reference number 6 to surround the electrode, as shown by the spacing to the sides of the electrode within the supports and also until meeting the proton conducting layer. Power is shown to be connected to both electrodes in figure 1. Figure 8 shows the addition of a reference electrode, reference number 5, also in contact with the proton conduction layer 2, as described in paragraph 53.

DIETZ et al teaches the apparatus of a gas sensor for the application of an AC and DC currents, as stated in column 2, lines 46-49. The use of these current applications in operational steps, such as for determining concentration or



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pumping hydrogen is functional language stating an intended use and is therefore not considered in a claim to apparatus.

At the time of invention, it would have been obvious to one of ordinary skill in the art to apply a DC and AC voltage in the same sensor as shown in DIETZ et al to the sensor of NADANAMI et al because DIETZ et al teaches the addition of both currents to the sensor enables temperature sensitive readings to be made, as stated in the abstract.

Regarding claim 7, in conjunction with the previous rejection of 6, it would have been obvious to one of ordinary skill in the art to have the second electrode function as a reference electrode, causing a two electrode sensor system, which is well known in the art.

Regarding claim 8, in conjunction with the previous rejections of claims 6, figure 8 shows the connection of the reference electrode and the first electrode via lines through voltmeter 10. However, the oxidation potential measurement is functional language stating an intended use and is therefore not considered in a claim to apparatus.

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Regarding claim 9, in conjunction with the previous rejection of claims 6 and 8, the potential measurement is functional language stating an intended use and is therefore not considered in a claim to apparatus.

Regarding claim 10, in conjunction with the previous rejection of claim 5, the connection of the AC and DC voltage is shown to be applied to the sensor, and in turn two electrodes, as shown in DIETZ et al figure 1. However, the use of the potential measurement is functional language stating an intended use and is therefore not considered in a claim to apparatus.

Regarding claims 11-16, in conjunction with the previous rejections of claims 5 and 10, the oxidation voltage and limits of voltage application values are functional language stating an intended use and are therefore not considered in a claim to apparatus.

Regarding claim 17, in conjunction with the previous rejection of claim 5, paragraph 40 of NADANAMI et al teaches the Pt catalyst of the electrodes to decrease carbon monoxide in the analysis gas.

Regarding claims 18-22, in conjunction with the previous rejection of claim 1, the manipulation of the frequencies to arrive at impedances or the use of waveforms

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in operation to determine current is intended use of the AC voltage application and is therefore not considered in a claim to apparatus.

Regarding claims 23 and 25, in conjunction with the previous rejection of claim 1, paragraph 40 of NADANAMI et al teaches the Pt catalyst of the electrodes to decrease carbon monoxide in the analysis gas.

10. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over NADANAMI et al (EP 1103807 A2), in view of GOPAL (US 6,602,630).

NADANAMI et al teaches all the limitations of claim 1. NADANAMI et al fails to teach the density of the platinum catalyst present on the electrode.

GOPAL teaches an electrode assembly with catalyst loading or areal density of 1 to 5 mg/cm<sup>2</sup>, in column 9, lines 15-22.

At the time of invention, it would have been obvious to use a platinum catalyst electrode loaded at 1 to mg/cm<sup>2</sup> as in GOPAL as the electrode of NADANAMI et al because it would be optimize the loading of the catalyst according to the desired degree of purification and adsorption, as stated in GOPAL column 9, lines 15-19.

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***Conclusion***

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to KOURTNEY R. SALZMAN whose telephone number is (571)270-5117. The examiner can normally be reached on Monday to Thursday 6:30AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

krs  
8/28/2008

/Kaj K Olsen/  
Primary Examiner, Art Unit 1795